U. S. Steel
Clairton Works
400 State Street
Clairton, PA 15025-1855

October 30, 1998

Director, Air Toxics & Radiation Division
U.S. EPA Region III
841 Chestnut Street
Philadelphia, PA 19107

SUBJECT: 1998 Summary Report
Leak Detection & Repair of Equipment in Benzene Service

Dear Director:

Enclosed please find two copies of the following benzene NESHAP monitoring report:

- Leak Detection and Repair of Equipment in Benzene Service for the period January 1998 through June 1998.

This report summarizes the results of the monitoring of equipment in benzene service at USS Clairton Works for fugitive emissions. The report ha been prepared to satisfy the requirements promulgated by 40 CFR 61 Subparts L and V.

If you have any questions regarding this package, please call me at (412) 233-1011.

Sincerely,

H. R. McCollum
Manager, Environmental &
Quality Assurance

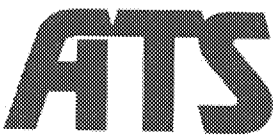
Enclosures
HRM/kb-98121

USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA

LEAK DETECTION AND REPAIR OF EQUIPMENT IN BENZENE SERVICE FOR THE PERIOD JANUARY 1998 THROUGH JUNE 1998

Prepared by

Advanced Technology Systems, Inc.
639 Alpha Drive
RIDC Park - O'Hara Township
Pittsburgh, Pennsylvania 15238-2819



September 1998

ADVANCED TECHNOLOGY SYSTEMS, INC.

USS CLAIRTON WORKS
A DIVISION OF USX CORPORATION
CLAIRTON, PENNSYLVANIA

LEAK DETECTION AND REPAIR OF EQUIPMENT IN BENZENE SERVICE FOR THE PERIOD JANUARY 1998 THROUGH JUNE 1998

Prepared by

Advanced Technology Systems, Inc.
639 Alpha Drive
RIDC Park - O'Hara Township
Pittsburgh, Pennsylvania 15238-2819

September 1998

ATS
ADVANCED TECHNOLOGY SYSTEMS, INC

TABLE OF CONTENTS

Page

1.0 INTRODUCTION 1

2.0 METHODOLOGIES 1

2.1 Identification of Equipment in Benzene Service 2

2.2 Monitoring of Equipment in Benzene Service 2

2.3 Annual Difficult-to-Monitor Monitoring Program

2.4 Semi-Annual Gas-Blanketing System Inspection

3.0 RESULTS 3

3.1 Leak Monitoring Results 3

3.2 Difficult-to-Monitor Monitoring Results

3.3 Gas-Blanketing System Inspection Results

LIST OF TABLES

Table 1 Equipment in Operation During NESHAPS Monitoring Periods - January through June 1998

Table 2 NESHAPS Monitoring of Components in Benzene Service - January through June 1998 Summary of Leakers

Table 3 NESHAPS Monitoring of Components in Benzene Service - January through June 1998 Leaker Identification and Repair

1.0 INTRODUCTION

This report fulfills the requirements of the United States Code of Federal Regulations, Title 40, Part 61 (40 CFR 61), Subpart L (National Emission Standard for Benzene Emissions from Coke By-Product Recovery Plants) and Subpart V (National Emission Standard for Equipment Leaks [Fugitive Emissions Sources]). The required monitoring was conducted at the USS Clairton Works facility located in Clairton, Pennsylvania; this report summarizes the results for the period January through June 1998.

Equipment "in benzene service" is defined as that equipment which contains or contacts a fluid (liquid or gas) that is at least 10 percent benzene by weight or an exhauster that contains or contacts a fluid (liquid or gas) at least 1 percent benzene by weight. The following four streams at USS Clairton Works meet the requirements of this regulation:

- Raw gas is greater than 1 percent benzene by weight and is present in the axi compressors
- Sub gas is greater than 10 percent benzene by weight and contacts the main regenerators, sub gas vacuum machines, sub gas coolers, sub gas separators, and light oil regenerators
- Sub sub gas is greater than 10 percent benzene and contacts the light oil regenerators, sub sub gas coolers, and sub sub gas separators
- Light oil contains greater than 10 percent benzene by weight, and contacts all separators, coolers, decanters, and the light oil transfer line to Aristech Corporation for further processing. Light oil is also used to wash screens in the final coolers and to periodically wash both the main and light oil regenerators.

2.0 METHODOLOGIES

The exact recordkeeping requirements, leak detection monitoring requirements, and initial and subsequent semiannual reporting requirements pertaining to 40 CFR 61, Subparts J and V can be

found in the Code of Federal Regulations. Specific aspects of these requirements as they apply to USS Clairton are described below.

2.1 Identification of Equipment in Benzene Service

The operation of the by-product processes require continual process piping maintenance and may involve physical changes in the processes. As a result, the leak detection and repair program requires a continual review of the operations to ensure that all equipment in benzene service is recognized and properly monitored. Identification includes both tabular registration of information on the individual components and a special series of process flow diagrams as an aid in specifically locating each component.

2.2 Monitoring of Equipment in Benzene Service

Monitoring of equipment in benzene service was performed in accordance with EPA Reference Method 21, Determination of Volatile Organic Compound Leaks. This method describes the selection and calibration of monitoring equipment as well as procedures used in the actual monitoring.

A Photovac MicroFID Intrinsically Safe Organic Vapor Meter (FID) and a photo ionization detector (PID) was used for monitoring. A gas standard containing approximately 10,000 ppmv methane in nitrogen was used for instrument calibration for the FID (hexane for the PID). Other concentration standards were prepared by diluting the gas standard with known volumes of air. Three-point calibrations were conducted at the beginning of each day of monitoring and a one-point verification was conducted at the end of the monitoring day.

All accessible components were monitored on a monthly, quarterly, semiannual, or annual basis as required by the applicable subpart regulations (at the request of USS Clairton Works, the alternative monitoring plans described in these subparts are not followed). It should be noted that many major

components, such as axi compressors, regenerators, and final coolers, are not in service at all times due to repairs and/or intermittent need, and pumping light oil to the barge loading dock is also intermittent. Monitoring of these components is conducted only if the equipment is in service at the time of monitoring. In addition, the various light oil wash systems are in intermittent use, and likewise are only monitored if in service at the time of monitoring.

Depending on the particular piece of equipment monitored, a leak is defined, in general, as any emission which results in a monitored reading greater than or equal to either 500 ppmv or 10,000 ppmv (whichever is applicable), or any visible leak. Any leaking components must have the initial repair attempted within 5 days of the determination; final repairs must be completed within 15 days of the determination.

2.3 Semi-Annual Gas-Blanketing System Inspection

The semi-annual gas-blanketing system inspection for the period was conducted during June 1998. The program was conducted according to a written Gas-Blanketed Vessel Monitoring Plan, contained in the plants' NESHAPS Program Manual. The full inspection combines both a monitoring of potential emission inspection points by Method 21, and a mechanical/chemical maintenance inspection of the same points.

The semi-annual program included 66 NESHAP inspection units. These are comprised of 52 gas-blanketed units that were in operation, which utilize a emergency pressure/suction relief seal pot arrangement, and 14 gas pressure and flow control stations contained in a series of 7 gas loops. The seven loops were also included in the required annual maintenance inspection. Clean coke oven gas is utilized as the blanketing medium. Each inspection unit contains a number of inspection points such as valves, vents, lid flange connectors, gasketed lid manways, etc.

3.0 RESULTS

3.1 Equipment Component Leak Monitoring Results

Table 1 indicates the process equipment units in operation during each period of monitoring. Table 2 summarizes the number of components monitored and the number of the leaking components.

As shown in Table 2 for the period January 1998 through June 1998, one component in benzene service was found to be leaking. This is equivalent to 0.03 percent leakers for the semi-annual period, well within the regulatory criteria to permit the quarterly monitoring frequency as conducted.

Shown in Table 3 is the specific identification and repair history of the leaking components. All the leakers were repaired within the required period, and subsequent monitoring indicated successful repair.

3.2 Gas-Blanketing System Inspection Results

Contained in the 66 NESHAPS units monitored in the gas-blanketing system are a total of 1817 potential inspection defect points. A total of 20 defects were recorded, or a 1.0% defect rate. Only 14 of these were actual emissions over the stipulated limit of 500 ppmv. The remaining 10 were due to open adjustable weir ports on 10 of the decanters.

TABLE 1
USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

EQUIPMENT IN OPERATION DURING
NESHAPS MONITORING PERIODS
JANUARY THROUGH JUNE 1998 SUMMARY

CONTROL ROOM #1

UNIT TYPE	USS ID #	NESHAPS FIG #	DATE 1/22/98	2/10/98	3/24/98	4/30/98	5/29/98	6/25/98
AXI COMPR.	C-100	1	ON	ON	ON	ON	ON	ON
	C-105	2	ON	ON	ON	ON	ON	ON
	C-110	3	ON	ON	ON	ON	ON	ON
	C-115	4	ON	ON	ON	ON	ON	ON
	C-120	5	ON	ON	SPARE	ON	REPAIR	ON
	C-125	6	ON	ON	ON	ON	ON	ON
	C-130	7	ON	ON	ON	ON	ON	ON
	C-135	8	SPARE	SPARE	ON	SPARE	SPARE	ON
	C-140	9	ON	ON	ON	REPAIR	ON	SPARE
	C-145	10	ON	SPARE	SPARE	SPARE	SPARE	SPARE
	C-150	11	ON	SPARE	ON	SPARE	ON	ON
	C-155	12	ON	ON	REPAIR	ON	ON	ON
	C-160	13	ON	ON	REPAIR	REPAIR	ON	ON
	C-165	14	REPAIR	REPAIR	ON	ON	ON	ON
	C-170	15	ON	ON	ON	ON	ON	ON
	C-175	16	REPAIR	ON	ON	ON	ON	ON
	C-180	17	ON	ON	ON	ON	ON	ON
	C-185	18	ON	ON	REPAIR	ON	REPAIR	REPAIR
SUPER STILL		21,22	ON	ON	ON	ON	ON	ON
FINAL COOLER	201	20	OFF	OFF	ON	ON	OFF	ON
	202	20	ON	ON	ON	ON	ON	ON
	203	20	ON	ON	ON	ON	ON	OFF
	206	20	OFF	OFF	OFF	OFF	ON	ON

CONTROL ROOM #2

UNIT TYPE	USS ID #	NESHAPS FIG #	DATE 1/22/98	2/10/98	3/24/98	4/30/98	5/29/98	6/25/98
VACUUM MACHINE	C-500	23	SPARE	ON	REPAIR	REPAIR	REPAIR	REPAIR
	C-502	24	REPAIR	REPAIR	ON	ON	ON	ON
	C-506	25	ON	ON	ON	ON	ON	ON
	C-509	26	ON	ON	ON	REPAIR	ON	ON
	C-512	27	ON	ON	ON	ON	ON	ON
	C-515	28	ON	SPARE	ON	ON	ON	ON
	C-518	29	ON	SPARE	ON	ON	ON	ON
	C-521	30	ON	ON	SPARE	SPARE	SPARE	SPARE
	C-524	31	SPARE	ON	SPARE	SPARE	SPARE	SPARE
	C-527	32	ON	ON	ON	ON	ON	ON
	C-530	33	SPARE	SPARE	ON	ON	ON	ON
	C-533	34	ON	ON	ON	ON	ON	ON
	C-536	35	REPAIR	REPAIR	REPAIR	REPAIR	REPAIR	REPAIR
	C-539	36	ON	ON	ON	ON	SPARE	REPAIR
	C-542	37	ON	ON	ON	ON	ON	ON
	C-545	38	ON	ON	ON	ON	ON	ON
	C-548	39	ON	SPARE	ON	SPARE	ON	ON
LO REGEN.	R-582	53	ON	ON	ON	ON	ON	ON
	R-584	54	ON	ON	ON	ON	ON	ON
	R-586	55	ON	ON	ON	OFF	ON	ON
	R-590	56	ON	ON	ON	ON	ON	ON
QUADS	1	40	ON	ON	ON	OFF	ON	ON
	2	41	ON	ON	OFF	ON	ON	ON
	3	42	ON	OFF	ON	ON	ON	ON
	4	43	ON	ON	ON	ON	ON	ON
	5	44	OFF	ON	ON	ON	ON	ON
	6	45	ON	ON	ON	ON	OFF	ON
	7	46	ON	ON	ON	ON	ON	OFF

TABLE 2
USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

NESHAPS MONITORING OF COMPONENTS IN BENZENE SERVICE
JANUARY THROUGH JUNE 1998 SUMMARY OF LEAKERS

MONITORING DATES		1/22/98	2/10/98	3/24,25 4/2,3	4/30/98	5/29/98	6/25,26,29/98
TOTAL COMPONENTS MONITORED		109	123	1647	59	59	1894
VALVES (1)	COMPONENTS MONITORED	99	113	1637	49	49	1884
	LEAKS DETECTED	1	0	0	0	0	0
	PERCENT LEAKERS			0.05			0
	COMP. NOT REPAIRED	0	0	0	0	0	0
	COMP. ON REPAIRABLE	0	0	0	0	0	0
PUMPS	COMPONENTS MONITORED	10	10	10	10	10	10
	LEAKS DETECTED	0	0	0	0	0	0
	PERCENT LEAKERS	0	0	0	0	0	0
	COMP. NOT REPAIRED	0	0	0	0	0	0
	COMP. ON REPAIRABLE	0	0	0	0	0	0
CONNECTOR	COMPONENTS MONITORED	0	0	0	0	0	0
	LEAKS DETECTED	0	0	0	0	0	0
	PERCENT LEAKERS	0	0	0	0	0	0
	COMP. NOT REPAIRED	0	0	0	0	0	0
	COMP. ON REPAIRABLE	0	0	0	0	0	0

(1) BASIC MONOTIRING IS QUARTERLY. PERCENT LEAKER CRITERIA IS ON A QUARTERLY BASIS, NUMBER SHOWN IS FOR ENTIRE CALENDAR QUARTER.

TABLE 3
USS CLAIRTON WORKS
CLAIRTON, PENNSYLVANIA

NESHAPS MONITORING OF COMPONENTS IN BENZENE SERVICE
JANUARY THROUGH JUNE 1998
LEAKER IDENTIFICATION AND REPAIR

MONITORING DATES	1/22/98						
CONTROL ROOM NUMBER	1						
TYPE COMPONENT							
ATS IDENTIFICATION	2184						
USS IDENTIFICATION							
NAME OF COMPONENT							
ORIGINAL MONITOR DATE	1/22/98						
ORIGINAL READING, PPMV							
REPAIR DATE	1/22/98						
REPAIR MONITORING DATE	1/22/98						
REPAIR READING, PPMV	65						
SECOND MONITOR DATE							
SECOND READING, PPMV							